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Attachment to [redacted] 25X

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Page 1

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AIR LIQUEFACTION PLANTS
PRODUCERS OF GASEOUS & LIQUID OXYGEN & NITROGEN FOR
MISSILES & INDUSTRY IN THE USSR & CHINA

1. SIGNIFICANCE: EXAMPLES OF SOVIET LIQUEFACTION PRODUCTION FACILITIES RELATED TO MISSILES AND INDUSTRY WHICH HAVE BEEN IDENTIFIED ON PHOTOGRAPHY.

2. LOCATION:

A.	DNEPROPETROVSK	INDUSTRY
B.	MINSK	INDUSTRY
C.	LVOV	INDUSTRY
D.	STERLITAMAK	INDUSTRY
E.	KRASNOYARSK	MISSILES
F.	KAPUSTIN YAR	MISSILES

3. REMARKS: A. LIQUID OXYGEN, COMMONLY REFERRED TO AS LOX, IS PROBABLY THE BEST KNOWN AND MOST IMPORTANT OF THE OXIDIZERS. IT WAS USED BY THE GERMANS IN WORLD WAR II V-2 MISSILES AND IS NOW USED EXTENSIVELY IN THE USA AND THE USSR.

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FOR INDUSTRIAL PURPOSES GASEOUS OXYGEN IS PREFERABLE.

B. LIQUID OXYGEN IS PRODUCED BY THE REPEATED COMPRESSION, COOLING AND SUBSEQUENT LIQUEFACTION OF AIR. THE LIQUID AIR IS THEN FRACTIONATED INTO LIQUID NITROGEN AND LIQUID OXYGEN - OR THE LIQUID NITROGEN MAY BE SEPARATED FROM THE LIQUID OXYGEN BY SIMPLE EVAPORATION.

THE IDENTIFICATION OF A LIQUID OXYGEN PRODUCTION PLANT MAY BE QUITE DIFFICULT SINCE ALL PROCESSING EQUIPMENT AND LOADING DOCKS MAY BE INSTALLED WITHIN THE BUILDING. EXTERNAL FEATURES SUCH AS LISTED BELOW HAVE ASSISTED IN THE IDENTIFICATION OF THE SITES DEPICTED ON THIS BRIEFING BOARD.

1) LARGE SUBSTATION

2) STORAGE TANKS

3) DISTILLATION OR FRACTIONATING TOWERS

4) AIR INTAKE STRUCTURES

5) LOADING PLATFORMS OR DOCKS

6) WATER STORAGE TANKS

7) WATER COOLING TOWERS OR TRAYS

8) INSULATED DOUBLE-WALL TANKS (KEYHOLE SHAPED)

9) GASHOLDERS

10) HIGH BAY PRODUCTION BUILDINGS

4. COLLATERAL: FID TOWN AND PLANT FOLDERS ARE USED EXTENSIVELY AS INDICATORS FOR LOCATION OF CRYOGENIC PRODUCTION FACILITIES.

5. COMMENT: OF THE SIX FACILITIES DEPICTED ON THE BRIEFING BOARD, 3 OF THESE FACILITIES HAVE BEEN KNOWN TO BE CRYOGENIC PRODUCERS FOR SOME TIME (MINSK, LVOV AND KRASNOYARSK) WHILE THE FACILITIES AT DNEPROPETROVSK, STERLITAMAK, AND KAPUSTIN YAR ARE VERY RECENTLY CONFIRMED CRYOGENIC PRODUCTION FACILITIES.

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AIR LIQUEFACTION PLANTS

PRODUCERS OF GASEOUS AND LIQUID OXYGEN AND NITROGEN FOR ROCKETS AND INDUSTRY

USSR & CHINA